OHANA DRONE
Unmanned Aircraft Systems (UAS)
Aircrew Training and Procedures Program

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Revision History

Update and Amendment Procedures to the Training Manual

All updates and / or amendments that are to be made to the Training Manual will be promulgated and approved by the PIC.

Each issuance of an update / amendment will include a summary of each and every change, with a detailed explanation, as well as the newly numbered pages that will need to be inserted / replaced in each manual.

Each official manual holder will be responsible for updating their manual with each update/amendment per the instructions issued.

Any discrepancy discovered during the issuance and update process will immediately be brought to the attention of the PIC. The holders of the Training Manual will provide verification of revision inclusions via return email that acknowledges both receipt and completion of revision as instructed.

List of Official Training Manual Holders

Copy #	**Person Responsible**	**Role**	**Location**
MASTER			
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Copy #4			
Copy #5			
Copy #6			

Tracking #	**Date Issued**	**Title**	**Description**
1.0	11/30/21	Original	1st version issued post final-review
1.1	02/16/22	Revision	Night Time Mission Training P. 10-11

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Contents

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INTRODUCTION

This Aircrew Training Program (ATP) is promulgated to facilitate the necessary program administration and training activities to ensure comprehensive and continuous qualifications for all company UAS pilots and other ground crew members, Visual Observers (VO's) and supporting personnel. For this program to be effective, the company will provide the necessary resources to accomplish and monitor all program aspects. Crewmember competency and currency, combined with active program management, will ensure that operational safety is maintained. It describes the training and qualification process including currency and proficiency requirements. This Aircrew Training Plan will be reviewed / updated annually. The training elements, ground instruction and flight instruction will be developed and conducted by qualified company personnel using organic resources. Under certain circumstances, a separate formal training course, deemed acceptable to the company, may be employed to satisfy requirements, and be conducted using outside personnel and resources.

This manual is not intended to be all inclusive but is instead a supplement to the Code of Federal Regulations (CFR), FAA Regulations, and State and local laws as well as the approved exemption to conduct Unmanned Aircraft Systems (UAS) operations allowed by special authority for certain UAS. Title 49 U.S.C. § 44807, and 14 C.F.R. Part 11.

APPLICABILITY

This manual is applicable to all flight and ground crewmembers supporting unmanned aircraft systems (UAS) operations and serves to augment and enhance the initial flight training/qualification course and operational manuals provided by OHANA DRONE and the aircraft manufacturer.

OBJECTIVE

The ATP's primary objective is to ensure that all flight crewmembers obtain and maintain the certification, qualification, and proficiency needed to effectively perform their responsibilities. The outcome of a successful ATP is the cultivation and maintenance of a professional "flying skill set" within the company to meet customer needs and support the growth and development of the company from within. A second objective is to maximize the efficiency of every training effort both in monetary cost and time. The ATP consists of initial and recurrent training. The goal of the ATP is to produce pilots and other crewmembers fully trained and qualified to handle any task set forth and within reason staying within the guidelines set forth by the company and the Federal Aviation Administration (FAA).

REVISIONS

As the company evolves, this program will continue to be revised. Currently, several positions and duties may be shared within one position title, but the qualifications remain the same. The processes and policies of the company and the structure of those documents must "serve" the goals and mission of the company and the employees that carry them out. It is the responsibility of all UAS flight crewmembers and any employee affected by this program, to identify program errors, provide feedback and recommend changes to improve the program, enhance operational safety, and help the company more effectively meet its business objectives.

RESPONSIBILITIES

a. PIC/Training Officer (TO) The PIC/TO will oversee all pilot and ground crew flight operations and ensure that company policies, procedures and directives are properly carried out by assigned flight and ground crew personnel. The PIC/TO will be a FAA licensed airman who possesses at a minimum, a Part 107 Remote Pilot Certificate (RPC). In addition, for operations over 55 lbs., the PIC will also hold a current Class II airman medical certificate as appropriate. The PIC/TO will also be primarily responsible for the training program administration and its updates and revision. The PIC/TO will develop and execute the training plans and ensure all flight and ground crewmembers are properly qualified and remain current in all aspects of UAS operations to ensure safety and efficiency in all operations and that all training records properly updated, secured/stored and managed.

b. Standardization Instructor/Evaluator (SI) – The SI will be appointed and endorsed by the PI/TO. The SI serves as the company's pilot and ground crew training qualification representative and aviation technical advisor and assists the TO with the development, implementation, and management of the training program. The SI will assist in the conduct of initial and refresher pilot and ground crew flight and mission training. The SI administers final qualification checks and will oversee continuation training for all personnel that have completed initial institutional UAS instruction and conduct random checks of those personnel already qualified to ensure proper standardization, crew resource management and safe practices are maintained. The SI will recommend and provide for the qualification of all company instructors.

Note that in some cases, two or more roles may be embodied by the same person. This is allowed where standard checks and balances are not required to be satisfied using different personnel.

TRAINING REQUIREMENTS

In the absence of any formal Federal Aviation Administration (FAA) approved UAS training curriculum or practical test standards, the knowledge and airmanship qualification standards will be developed by the company with reference to, and guidance from 14 CFR applicable Parts. The company will provide the training, administer examinations, and conduct evaluations in accordance with this program except under certain circumstances when a third party is contracted to satisfy specific training requirements.

Part 107 contains no flight proficiency requirements, however, to ensure adequate flight proficiency, OHANA DRONE will require demonstrated multi-rotor proficiency in:

- Preflight preparation;
- Preflight procedures;
- Airport and heliport operations;
- Hovering maneuvers;
- Takeoffs, landings, and go-arounds;
- Performance maneuvers;

- Navigation;
- Emergency operations;
- Special operations; and
- Postflight procedures.

QUALIFICATION

Qualifications required for PIC(s):

a. The PIC will be a FAA licensed who possesses at least a Remote Pilot Certificate and a Class II medical certificate.

b. The PIC shall have accumulated and logged at least 20 hours of total flight time of a multi-rotor system as the PIC with at least 10 take-off and landings within the previous 90 days to remain current. Such log of which shall be made available to the Administrator upon request.

c. For initial qualification, the PIC must have successfully completed the indoctrination curriculum, company ground training, written or oral knowledge test, and the flight evaluation;

For recurrent qualification, the PIC need only complete the Standardization Evaluation (knowledge test (written OR Oral) and the flight evaluation).

Qualifications required for Visual Observer (VO):

a. The VO must have also accumulated and logged a minimum of 10 flight cycles and 5 hours of total time as a UAS VO;

b. The VO must have logged at least 5 hours and 3 takeoffs and landings acting within their designation within the preceding 90 days to remain current;

c. For initial qualification, the VO must have successfully completed the indoctrination curriculum, the company ground training for the system, mission communications and crew resource management.

d. For recurrent qualification, the VO need only complete an oral Standardization Evaluation knowledge test.

Initial and Recurrent Training Curriculum **(Reference FAR part 61 and part 107)**

1. System Description – Aircraft, Sensor, Control Station, Telemetry, Flight Modes
2. Ground Control Station (GCS) – Familiarity, Functions, Indications, Warning Displays
3. Sensor Control – Controls, Recording, Functionality
4. UAS System - Set-Up, assembly, disassembly and pack up
5. UAS Safety – battery handling/charging/storage procedures
6. Basic Aerodynamics – Lift, Drag, Weight, Thrust, Pitch, Trajectory Control
7. Federal Aviation Regulations – Rules of the Air (Basic)
8. Airspace - Classifications with related limitations and weather criteria
9. VFR Aeronautical Charts - Orientation
10. Basic Weather and Forecast Interpretation
11. Visual Flight Rules
12. Use of Checklists

13. Mission Planning, operational area safety risk assessment
14. Normal Operations – preflight, launch, inflight mission, recovery, post-flight
15. Crew Resource Management and Communications
16. Air Traffic Control Coordination/Communications
17. Aeronautical Decision Making and Judgment
18. Loss of Control Link (signal)
19. Loss of Sensor Link (signal)
20. Loss of GCS Power
21. Loss of Visual Contact
22. Fly Away
23. See and Avoid actions
24. Operational Risk Management (ORM)
25. Company Policies and Standard Operating Procedures (FOPM)

MISSION TRAINING

The UAS mission training is separate from UAS flight and ground training and qualification. Mission Training and the operation of the mission equipment is an integral part of being a qualified crewmember and essential to accomplishing the company's operational objectives. This training must be completed before any crewmember is qualified to perform any operational mission.

Night-time Mission Training

Pilot In Command (Pic) And Visual Observer(s)

Ohana Drone will provide training by which the PIC and VO will be able to continuously know and determine the position, altitude, attitude, and movement of their UA.

Ohana Drone will assure all required persons participating in the UAS operation have knowledge to recognize and overcome visual illusions caused by darkness and understand physiological conditions which may degrade night vision. Ohana Drone will ensure one of more VO(s) are used during night-time flight operations. The VO and the PIC will maintain effective two-way communication and will coordinate with one another to scan the airspace where the UAS is operating for any potential collision hazard and will both maintain operational awareness of the position of the UA.

All Pilots and VOs will be thoroughly trained in:

- Chapter 17, Aeromedical Factors of the Pilot's Handbook of Aeronautical knowledge, pages 17-22 through 17-29.
- All PICs and V0s must successfully complete (90%) the attached exam

When a night flight is scheduled, pilots and crew members should wear neutral density (N-15) sunglasses or equivalent filter lenses when exposed to bright sunlight during the day. This precaution increases the rate of dark adaptation at night and improves night visual sensitivity.

Crew members will be trained in and comply with the IMSAFE checklist prior to flying at night.

- Illness – The will be no flight operations if any crewmember is experiencing any illness
- Medication – No flight operations will occur if any crew member is taking medications not approved by the FAA
- Stress – There will be no flight operations is any crew member is experiencing undue stress
- Alcohol – Will comply with the restrictions in 14 CFR Part 120
- Fatigue – All crew members will comply with the provisions of crew resource management and crew rest identified within this manual
- Eating – All crewmembers will ensure they've had time to eat and adequate meal and hydrate prior to night-time operations

TRAINING PREREQUISITES

Any crewmember returning to a crew member position after having been absent from flight operations for more than 180 consecutive days will receive refresher training and undergo a standardization evaluation. Refresher training should include academic courses and practice of all applicable elements.

TRAINING RECORDS

The PIC/TO must ensure that a training record is prepared and maintained for each UAS pilot and ground crew member assigned. The training record will be updated during training cycles, periodically reviewed and securely stored in an appropriate location accessible by the PIC/TO and the Standardization Instructor. A training record form will be used to document all training and evaluation flights.

STANDARDIZATION EVALUATIONS

The conduct of standardization evaluations is a principal means of assessing operational standardization and crewmember proficiency. It is the principal method of establishing and maintaining the safest possible flight operation. The purpose of an evaluation is to determine the initial and continued mission qualification of all assigned crewmembers

This evaluation consists of a records review, a written or oral examination and a flight evaluation that is administered by the SI or a designated representative. The SI or a designated representative will complete the evaluation within 15 calendar days after the completion of initial training or within one month of the annual qualification date.

Company crewmembers must pass each evaluation element to acquire and maintain their qualification. The recurrent standardization evaluation must be completed from one month prior to one month after the initial qualification date.

The terms, "without error," "correctly", "minor deviation", and "incorrectly" apply to all training/evaluation elements. Many standards are common to several elements. Individual instructor techniques are not standards, nor are they used as grading elements. Unless otherwise specified in the training/evaluation elements, the common standards below apply. Alternate or additional standards will be listed in individual tasks. All tasks—

- Perform crew coordination actions.
- **Do not** exceed UAS limitations.
- Utilize applicable Checklist
- Utilize applicable terminology.

The standardization evaluation examinations serve to measure a crewmember's UAS, company FOPM, and general aviation knowledge. These examinations validate the crewmembers' knowledge proficiency and readiness to safely perform company UAS operations.

The UAS pilot and ground crew member written examination consists of one, 20 question "Closed Book" and one 20 question "Open-Book" examination that is derived from the curriculum described previously in this program. The minimum passing score is 70 percent, corrected to 100 percent. The UAS Flight Evaluation consists of an oral exam and a complete flight mission.

EVALUATION PROCESS

The value of any evaluation depends upon strict adherence to fundamental principles, clearly established criteria and standardization of performance. The method of evaluation must be based on uniform and standard objectives. Additionally, the evaluation method must be consistent with the company's mission and adhere to the appropriate FOPM and regulations. Moreover, the evaluation must be conducted in a manner that is purpose oriented. A thorough understanding of the purpose of the evaluation, and cooperation by all participants is necessary to fulfill the evaluation objectives. The emphasis is on all of the participants, not just the examinee.

The evaluation must produce specific findings to identify performance errors, misunderstandings or additional training needs. General comments do not always provide the direction and guidance essential for improvement. The evaluation must pinpoint both strengths and weaknesses.
Evaluations are "dynamic" activities. Therefore, every possible event or occurrence cannot be anticipated. If situations arise that are not covered by this guidance, the use sound judgment is expected so that the evaluation event may be continued in the most logical and safe manner. Such circumstances shall be recorded on the form in the remarks section.

NO-NOTICE EVALUATIONS (SPOT CHECKS)

The SI will establish a "No-Notice" evaluation program to monitor crewmember proficiency, safety and effectiveness. Evaluations may consist of flight, oral, or written examinations or any combination of these as deemed necessary by the SI. Annotation to the training record and reporting notifications and any corrective actions will also be monitored and recorded.

GRADING CRIERIA

a. Oral Evaluation: The examinee must demonstrate a working knowledge and understanding of the subject areas presented. The SI will assess the examinee's knowledge during the oral evaluation.

b. Flight Mission Evaluation: Performance standards are based on a "simple" mission scenario. Grading is based on meeting the minimum standards of the required evaluation elements. Optional elements may be evaluated by the SI based upon the mission demands and proficiency of the crew member. Failure to meet acceptable standards for optional elements will not constitute a failure but will be recorded for focused refresher training as deemed necessary by the SI.
The evaluation sequence consists of the four phases given below. The SI will determine the amount of time devoted to each phase. When the examinee is a designated Instructor, the evaluation procedure will require the SI to reverse the roles with the examinee. When the evaluator uses this technique, the examinee must understand how the role-reversal will be conducted and when it will be in effect.

a. Phase 1— Records Review and Briefing: The SI will complete a thorough review of the examinee's records to verify that the examinee meets all criteria for initial or recurrent qualification. The SI will discuss the purpose of the evaluation, explain the evaluation procedure, and review the standards and criteria to be used.

Note: If the examinee is a designated Instructor, he or she will be evaluated on established policies and procedures and the ability to effectively convey and evaluate the teaching concepts and topics in an effective manner. The examinee must demonstrate a working knowledge of the disciplines, standards, and mission tasks he or she will be instructing/evaluating. The examinee must also demonstrate an ability to determine when a pilot or ground crew member has not performed to a satisfactory level.

b. Phase 2—Oral examination: The examinee must have a working knowledge and understanding of all applicable topics in the respective subject areas below. As a minimum, the evaluator will select two topics from each subject area. An instructor must also demonstrate the ability to instruct and evaluate any curriculum element.

1. Applicable Federal Aviation Regulations
2. National Airspace System Classifications with related weather and visibility requirements
3. Company Standard Operating Procedures and Policies (FOPM)
4. UAS Operational Publications (i.e. Flight Operators Manual, Maintenance Manuals or GCS Manual (as appropriate)
5. Daily Flight/Mission logs, Maintenance logs
6. UAS System Familiarity, Operating limitations and restrictions. Topics areas may include: (a) Battery Handling, Charging Storage; (b) Airspeed limits; (c) Environmental Restrictions; (d) Other limitations; (e) Ground Control Station functions; (f) UAS antenna and telemetry issues.
7. UAS Emergency Procedures / malfunction recognition and analysis. Topics areas may include: (a) Emergency terms and their definitions; (b) Electrical System Malfunctions; (c) Loss of Control Link; (d) Loss of Sensor Signal; (e) Loss of Communications;

c. Phase 3—Flight Evaluation, if required, the following areas will be evaluated:

(1) Mission Planning
(2) Mission Briefing.
(3) Proper use of checklists.

(4) Preflight Procedures.
(5) Takeoff Procedures.
(6) Mission Management with Crew Coordination
(7) Before landing and After-landing Procedures.
(8) Post-Flight Procedures
(9) Mission Record Keeping

d. Phase 4—Evaluation Debriefing. Upon completing the Standardization Evaluation, the SI will discuss the overall event and point out examinee's strengths and weaknesses and provide specific recommendations for improvement of a knowledge or skill area. The SI will declare the examinee has successfully passed or failed the evaluation. In the case of failures, the SI must discuss and document any area not performed to standards in the training record. The SI will complete the evaluation form and ensure that the examinee reviews and initials it.

Note. The SI must inform the examinee of any restrictions, limitations, or revocations that the SI will recommend to the PIC/TO following an unsatisfactory evaluation. Further disposition concerning follow-up action following such event will be the responsibility of the PIC/TO.

EVALUATION FORM

A company standardized Evaluation Form will be used to permanently record all crewmember evaluations. It is also used to record any change in crewmember status or other significant events. All company evaluation forms shall be retained in the crewmembers training record.

Note. Involvement in any accident or incident and the results of any post-accident evaluation (if given) must be recorded in the crewmembers training record.

FAILURE TO MEET REQUIREMENTS

When ATP requirements are not met, the PIC/TO and the Standardization Instructor will investigate the existing circumstances concerning the disposition and status of the crewmember. The PIC/TO will take one of the following actions:

(1) Authorize the crewmember to complete remedial training within 30-days and participate in a recheck.
(2) Authorize the crewmember to take an immediate recheck.
(3) Remove the crewmember from performing any UAS flight operations duties.

REMOVAL OF CREWMEMBER DESIGNATIONS

a. Removal for a Training deficiency: Any crew member who has their designation removed for a training deficiency shall not be permitted or scheduled to conduct any flight operations.

b. Removal for other than a training deficiency: Any crew member who has their designation removed for anything other than a training deficiency must be interviewed by the PIC/TO to determine desirability/suitability to continue in the company's flight program. If they are deemed

suitable for continuation in the flight-program they will have to undergo the complete initial training and qualification program to get their designation reinstated.

REQUIREMENTS TO PERFORM MAINTENANCE FUNCTIONAL CHECKS

The PIC is authorized to designate other pilots or crewmembers to perform maintenance function checks (ground/airborne). Candidates to perform maintenance functions are to be selected from experienced crewmembers who are current, qualified and designated. The crewmembers assigned to perform post-maintenance checks will demonstrate proficiency in all maintenance functional checks (ground/airborne) according to appropriate maintenance standards and company policy.

TRAINING RISK MANAGEMENT

Challenging, realistic training conducted to demanding standards is the cornerstone of the company's safety posture and its continued reliability to satisfy customer demands. The potential for accidents increases as training realism or training demands increase. It is therefore the responsibility of the PIC/TO and the SI to ensure that the limits of training and evaluation events do not cross an unacceptable risk threshold. Accomplishing the training and evaluation objective must be weighed against protecting crewmembers and any UAS assets involved.

An accident or incident during a training or evaluation event essentially impacts not only the asset or those directly affected but also seriously jeopardizes the company's reputation for safe and reliable operations and can create serious operational and financial burdens that may drain precious resources.

Risk management is a tool that company employees shall use to make smart risk decisions in all aspects of company operations. It permits trainers and trainees to execute more realistic training without ignoring or overlooking increasing risk levels. Risk management is a method of getting the job done by identifying those training and evaluation events or elements that present an elevated or unacceptable risk and taking action to eliminate, reduce, or control that risk or cancel the element altogether. Risk management thereby becomes a fully integrated part of every training, evaluation and mission planning and execution event.

Risk management is not complex, technical, or difficult. It is a simple awareness tool to promote a more informed decision-making process. It permits instructors, pilots, and crew members to think through any mission to discover hazards that pose risks and examine mission demands against those risks. The company expects all of its employees to employ and exercise the risk management concepts to further support the safety posture of the company.

RISK MANAGEMENT PROCESS

Step 1- Identify Hazards: Identify the hazards that may impact an operational sequence and list them chronologically. This process will help detect specific risks associated with all training or evaluation elements. Safety can be built into an operation by first seeing the operation in its entirety. Operations invariably can be broken down into a series of phases, each with special characteristics and considerations. Operations have a time factor, a beginning to ending series of events in which

the timing of events is often as significant as the events themselves. The operations analysis is a useful tool in quickly defining the flow and time sequence of events in an operation.

Step 2 - Assess Risks: Determine the magnitude of risks by estimating the probability and severity the hazards represent in order to quantify the risk they represent to the successful mission outcome. Assess each event hazard and determine whether it is routine and make an initial risk assessment. Ensure that standards for routine events are adequate to provide an acceptable level of risk.

Step 3 - Make risk decisions and develop risk controls (or mitigations): Make risk acceptance decisions by balancing risk benefits against risk assessments. Eliminate unnecessary risks. Reduce the magnitude of mission risks by applying appropriate controls. Controls range from hazard awareness to detailed operational procedures. Focus on high hazard events not covered by a good set of standards.

Step 4 - Implement Controls: Integrate specific controls into training and evaluation planning, FOPMs, and training performance standards.

Step 5 - Supervise. Determine the effectiveness of the controls: The PIC/TO and the SI must enforce controls through a robust standardization program. This is the key to continued operational safety and loss control.

Sample UAS Pilot / Crewmember Academic Curriculum

Introduction	Mission Planning
ATC Coordination/Communication	UAS Systems Orientation
Crew Resource Mgt /Coordination	Rotor Blades/Propellers
Standard Operating Procedures	Battery Handling, Charging, Storage
Sectional Chart Orientation	Mission Navigation Equipment
Visual Flight Rules Orientation	Electrical system
Weight and balance requirements	Basic Weather Orientation
Mission Records	Airspace
Airplane Flight Manual	Normal Procedures
Emergency Procedures	Sensor(s) (image capture cameras)
Operating Limitations / Restrictions	Aeromedical Factors
Malfunction Recognition / Analysis	Basic Aerodynamics

Sample UAS Pilot / Crewmember Qualification Curriculum

Element Name
Conduct Crew Mission Brief
Plan Visual Flight Rules Flight
Perform Exterior Inspection Procedures
Perform Engine Start/System Check
Perform Radio Communication Procedures
Perform Take-off and Landing
Perform Manual Flight Mode
Perform Power Management Procedures
Perform Automatic Flight Mode
React to System Emergency
Perform Payload Operational Checks
Perform Emergency Procedures
React to Inadvertent Instrument Conditions
Operate the Optical Sensors Payload(s)
Perform Mission Planning Procedures
Perform After Landing Procedures

Sample Training/Evaluation Elements List (Not all inclusive)

1. Perform Mission Planning

Criteria:

1. Obtain and analyze weather briefing to determine that weather and environmental conditions are adequate to complete the mission
2. Perform VFR Sectional Chart and area photography review. Ensure that all known hazards are identified Determine if the pilot, Sensor Operator, Visual Observer, and aircraft are capable of completing the assigned mission.
3. Determine the size, scope and boundaries of the operating area and determine entry and exit points, flight obstacles/obstructions.
4. Determine whether the flight can be performed under VFR conditions within the altitude and area boundary limits. (Ref applicable Code of Federal Regulations/host nation regulations, local regulations and FOPMs.
5. Determine Battery requirements and limitations
6. Complete mission paperwork per company FOPM. Perform mission risk management assessment per company FOPM.
7. Record mission data.
8. Contact ATC for coordination. (as necessary)

Performance:

a. The PIC will ensure that crewmembers are current and qualified, and that the aircraft is equipped to accomplish the assigned mission. The PIC may direct other crewmembers to complete some portions of the mission planning.

b. The PIC will obtain current and forecast weather information from appropriate weather sources. After ensuring that the flight can be completed under VFR, check VFR sectional chart and other appropriate sources for any restrictions that may apply to the operations area. Determine the magnetic heading, approximate ground speed, and estimated time for each segment. Compute total flight time. Review aircraft maintenance logbook for any outstanding write-ups that may affect mission accomplishment. Complete the mission planning paperwork.

2. Conduct a Crew Mission Brief

Criteria:

a. The PIC will participate in the mission approval process.

b. The PIC will be briefed and will acknowledge full understanding of mission objectives and responsibilities.

c. The PIC will brief the assigned crew per company FOPM with emphasis on safety

d. The PIC will require the crew members to acknowledge that they fully understand the assignment of duties and responsibilities.

Performance:

a. The PIC has overall responsibility for the crew mission briefing. The PIC may direct the other crewmembers to perform all or part of the crew briefing.

b. The PIC will ensure all aircraft systems, mission, and safety information is correct.

Note. *An essential element of the mission briefing is the post-mission review that follows every mission's conclusion.*

d. The crewmembers being briefed will ask the PIC any question concerning the briefed mission and acknowledge their duties, and responsibilities. Lessons learned from previous debriefings should be recorded and addressed as applicable during the crew briefing as well as time and location of the post-mission debrief upon completion of mission.

e. The PIC will brief the mission using a company-approved crew mission briefing checklist.

Sample UAS mission briefing checklist

Mission overview:

- Date/Time/Location
- Mission Objectives
- Operational Area / Altitude
- Weather
- Expected Flight Duration and Number of Mission Sorties
- Battery Management
- Crew Duties, Communications, Coordination
- Aircraft and Sensor Package
- Authorization Paperwork
- ATC Notifications/Coordination
- Safety Considerations/Risk Management
- Emergency Plans
- Operational Contingencies / Customer Notifications

3. Perform Preflight / Exterior Inspection

Criteria:

1. Without error, the PIC will perform exterior preflight inspections according to OEM requirements and company checklist.
2. The PIC will correctly enter and verify the appropriate information in Daily Flight Log. The daily flight log is described within the Flight Operations and Procedures Manual (FOPM).
3. The PIC and crewmembers will correctly perform crew coordination actions.

Performance:

1. The PIC will ensure that proper exterior preflight inspections are accomplished using an appropriate checklist.

4. Perform Payload Operational Checks

Criteria:

1. PIC will perform operational checks on all installed payloads and ensure they are mission ready.

Performance:

1. PIC will perform operational checks as necessary to determine whether the installed payloads are operating properly. The PIC will determine the effects of any payload discrepancies against the needs of the mission. The PIC will record the mission readiness of the payloads when the checks are completed and record any discrepancies in the company established maintenance log.

5. Perform Radio Communication Procedures

Criteria:

1. The PIC and crew members will check, set and operate radios as required.
2. The PIC will establish and maintain radio contact with the desired individual, or air traffic control (ATC) facility.
3. The PIC or designated crewmember will operate all internal/external communication systems and mission equipment.
4. Perform two-way radio failure procedures per company FOPM.
5. The PIC and crewmembers will adjust system radios to the proper frequencies.
6. When communicating with ATC facilities, the PIC will use the correct radio communication procedures and phraseology according to Federal Aviation Regulations (FAR) and the Aeronautical Information Manual (AIM),
7. The PIC and crewmembers will acknowledge each radio communication by using the correct aircraft call sign.

Performance:

a. The PIC will assure all crewmembers are on the proper radio frequencies per mission requirements during the crew briefing and will indicate which crewmember will establish and maintain primary communications. However, if crewmembers monitor two frequencies simultaneously, they will keep each other informed of any actions or communications conducted on their respective frequency.
b. Crewmembers should monitor radios and establish initial contact. In case of two-way radio failure during a mission, the PIC will designate a crewmember to troubleshoot the appropriate equipment and announce results.
c. The crewmembers will use standard radio communications procedures, phraseology and terms.

d. When advised to change frequencies, the PIC and each assigned crewmember will acknowledge the transmission before making the change. The assigned crewmember will select the new frequency as soon as possible unless instructed to do so at a specific time, fix, or altitude.
e. Crewmembers will turn-on, self-test, and conduct operational checks of all internal and external communication systems. All crewmembers will employ the communications equipment as directed by company FOPM or as briefed.
f. In case of two-way radio failure, each crewmember will attempt to reestablish communications by using alternate frequencies and radios. If unsuccessful, execute lost communication procedures IAW appropriate company FOPM.

6. Perform Take-off

Criteria:

1. The PIC will configure aircraft for takeoff IAW OEM recommended procedures.
2. Without error, the PIC will perform takeoff checks and procedures IAW OEM Operators Manual, company FOPM, and Check List.
3. Without error, the PIC will complete take-off IAW OEM Operators Manual, company FOPM, and Check List.
4. Without error, the PIC will complete the post take-off checks and procedures IAW OEM Operators Manual, company FOPM, and Check List.

Performance:

a. The PIC will select the appropriate takeoff heading based on weather and wind conditions. The PIC will remain focused on clearing the aircraft and obstacle avoidance and will monitor system indications for abort parameters.
b. The Visual Observer will remain focused primarily on clearing the aircraft and provide adequate warning of obstacles or intruding aircraft.
c. The PIC will announce intention to takeoff to crew members and complete all take-off checks and procedures in accordance with FOPM and the Check List.
d. All crewmembers will use standard "challenge and response" communication during completion of take-off checks, and post take-off checks.
e. If aircraft exceeds any of the parameters listed in the OEM Operators Manual, the PIC will perform a takeoff abort.
f. The PIC will perform post-takeoff procedures IAW OEM Operators Manual/Check List.

7. Perform Flight in Manual Mode

Criteria:

1. Upon entry into manual mode ensure aircraft maintains proper altitude and airspeed.
2. Adjust airspeed commands to meet time-on-target (TOT) requirements in accordance with

job requirements, while staying within the operating parameters.

3. Adjust altitude commands to meet mission requirements.
4. Adjust airspeed and heading for winds. Maintain heading to stay in approved airspace boundaries.
5. Ensure aircraft maintains airspeed and altitude within parameters of the aircraft operating limits.
6. The PIC and crewmembers will correctly perform crew coordination actions.

Performance:

a. The PIC's focus will be on the maintaining VLOS contact with the aircraft at all times and ensure the aircraft is responding as commanded.
b. Determine heading. From the current aircraft location and appropriate map display, determine the correct magnetic heading to the next checkpoint/target corrected for wind.
c. From the current aircraft position, the PIC/SO will estimate the aircraft altitude then initiate a climb or descent on the GCS and monitor engine instruments as well as altitude, airspeed and rate of climb indicators for proper response.
d. The PIC will monitor ground course and adjust flight parameters as necessary to remain within the mission boundaries to accomplish the mission.

8. Perform Flight Utilizing Automatic Flight Modes

Criteria:

1. Without error, the PIC will complete portions of the mission utilizing automatic navigation modes as described in the OEM Operators Manual and Check List.
2. Without error, the PIC will engage and verify the aircraft enters the selected flight mode.
3. Without error, verify airspeed, heading, and altitude are correctly set for mission.
4. Correctly perform crew coordination actions.

Performance:

1. The PIC will announce all flight mode changes to the crew members and verify that the aircraft enters the selected flight mode by monitoring the flight mode on the GCS.
2. The PIC will load a mission to the aircraft as required. Verify waypoints, airspeed and altitude are appropriate for the mission and **do not** exceed system limitations. The PIC will select automatic flight mode on the GCS and verify. The PIC can override the airspeed and altitude and control each parameter via inputs to the GCS programming.

9. Perform Take-off and Landing Abort

Criteria:

1. Without error, the PIC will complete the takeoff or before landing check as appropriate according to Operators Manual or Check List.
2. Monitor safe flight parameters to determine when to initiate an abort on takeoff or landing.

3. Announce abort (takeoff or landing as appropriate).
4. Without error perform aircraft takeoff/landing checklist.
5. Correctly perform crew coordination actions.

Performance:

1. During takeoff or landing, should any crew member notice a safety of flight issue, they will announce abort, at which time the PIC will initiate the abort immediately.
   a. Takeoff abort:
   (1) The PIC will take immediate action to terminate the launch or initiate an immediate recovery.
   b. Landing abort:
   (1) Prior to touchdown, the PIC will take immediate action to climb the aircraft to a safe operating altitude and verify that the aircraft is climbing and heading to the Go-Around Point.
   (2) After determining the circumstances that necessitated the abort, the PIC will take control of the aircraft in manual mode and commence another landing attempt.

10. Perform Emergency Procedures

Criteria:

1. Without error, the PIC will execute procedures and checks per the OEM Operators Manual and Emergency Check List.
2. The PIC will correctly determine any malfunctions and apply corrective action/troubleshooting procedures to return the aircraft to a safe operating mode.
3. Correctly perform crew coordination actions.

Performance:

1. The PIC will announce the status of the aircraft to all crewmembers and execute appropriate emergency procedures.

11. React to Inadvertent Instrument Meteorological Condition

Criteria:

1. All crewmembers shall conduct weather and aircraft scans continuously.
2. The PIC will maneuver the aircraft as needed to avoid or maneuver out of obscurations. Climb, descend or turn as required, and/or briefed.
3. The PIC or designated crewmember will request ATC assistance; acknowledge and record the appropriate information.
4. If unable to maintain visual meteorological conditions (VMC), then immediately initiate recovery procedures and land.

Performance:

1. The PIC, upon determining that Visual Line of Sight with the aircraft is lost will proceed as

follows:

a. Maneuver UAS out of IMC as required by commanding a heading change, descent, or climb (if necessary to avoid known obstacles), to return to VMC conditions or a “Return to Home” command.

2. If communications with ATC are necessary, The PIC or designated crewmember will maintain the required communications with ATC, and record ATC information as received when required.